DOCUMENT RESUME

ED 049 154 SP 004 681

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TITLE	Appendix to the Brophy-Good Dyadic Interaction Coding Manual. Additional Coding Categories and Procedures.
INSTITUTION	Texas Univ., Austin. Research and Development Center for Teacher Education.
SPONS AGENCY	National Inst. of Mental Health (DHEW), Bethesda, Md.; Office of Education (DHEW), Washington, D.C.
PUB DATE	Oct 70
CONTRACT	OEC-6-10-108
NOTE	19p.
EDRS PRICE	EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS	Classroom Communication, *Classroom Observation Techniques, Codification, Student Teacher Relationship, Verbal Communication
IDENTIFIERS	*Brophy Good Dyadic Interaction System

ABSTRACT

This paper contains optional modifications and additions to the Brophy-Good Dyadic Interaction Coding Manual (ED 042 688). Included are 1) suggestions for changes in the way level-of-question is coded; 2) modifications of the child's answer categories for simplification or expansion; 3) new distinctions for coding the teacher's feedback following correct responses from the children (allowing expansion and diversification of the four categories). Also described are new categories for use at the secondary level which have been added to cover affective aspects of teacher-pupil interaction and increased student activity (student initiated response opportunities, joking, and personal conversation). The two basic types of measures which can be derived from the system are discussed: simple frequency counts (quantitative) and percentage scores (qualitative). Twenty-six of the more useful frequency measures are listed, and 50 percentage measures of teacher-child interaction are listed under the various categories: measures of teacher vs. child initiation of dyadic interactions; student initiated response opportunities over total response opportunities; level-of-question measures; types of dyadic interaction; child performance measures; praise and criticism of academic performance; praise and criticism of behavior; quality of feedback; and sustaining the interaction after the initial response opportunity. (JS)

ED049154

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Appendix to the Brophy-Good Dyadic Interaction Coding Manual: Additional Coding Categories and Procedures

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Addendum to Report Series No. 27

October, 1970

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The research discussed herein was supported in part by the U. S. Office of Education Contract OE 6-10-108, The Research and Development Center for Teacher Education. The opinions expressed herein do not necessarily reflect the position or policy of the Office of Education and no official endorsement by the Office of Education should be inferred.

SP004681

ACKNOWLEDGEMENTS

This research has been supported by NIMH Grant No. MHI 7907-01 from the Mental Health Small Grants Program of the Department of Health, Education and Welfare, in addition to the support of the Research and Development Center for Teacher Education.

The authors wish to thank Carolyn Evertson, Suzi Good, Teresa Harris, Sue Jones, Vern Jones, Sonia Mendoza, and Kathy Paredes for their suggestions regarding coding procedures, and Hazel DeShong for her help in manuscript preparation

Since the manual for coding dyadic interaction in the classroom (R&D Report #27) was completed in December, 1969, experience in using it to collect classroom data and to give feedback to teachers has suggested several additions and modifications. These are listed below. As with most of the other components of the dyadic system, these suggested additional categories are optional: they may or may not be appropriate for a given purpose.

Level of Question

Two suggestions have been made for changes in the way level of question is coded. The first, suggested by experience in using the system at higher levels than the early primary grades, involves the addition of the category "opinion" questions. Such questions occur frequently when the teacher starts a discussion on some topic, particularly in literature and social science classes. The teacher's purpose is usually to get a discussion going, and her responses to the children are usually conditioned more by this general aim than by a concern for the correctness or incorrectness of a given opinion. Frequently the discussion will center on very complex matters which have no clearly identifiable right or wrong answers. In the system as presented in the manual such questions would have to be coded either as process questions or self-reference questions. Either way was usually unsatisfactory, since coding such an opinion question as a "process" question suggested that it was more a matter of fact than an opinion, and coding it as a self-reference question masked the fact that the question was related to curriculum goals. The category of opinion questions would handle such questions that lie in between. It would set off such questions from process questions, which elicit factual answers identifiable as correct or incorrect (even though they may be lengthy). The opinion question can also be discriminated from the preference type of self-reference question. The opinion question will require the student to take a position on an issue or to predict the outcome of an experiment or hypothetical situation. In either case the opinion question assumes that the child's opinion stems from an articulated rationale rather than from chance or whim. That is, if pressed to

explain his opinion he could give reasons as to why he formed it. In contrast, the preference type of self-reference question merely asks the child to express a preference or choose among alternatives on the basis of taste. The question is not as centrally related to curriculum goals as the opinion question, and the child does not have to go through an articulated thinking process in order to answer it.

Examples of opinion questions would include the following:

Should 18 year-olds be allowed to vote?

What do you think the author is trying to communicate in this poem?

Should we pass tougher gun control laws?

Could there be intelligent life on other planets?

What would the world be like today if electricity hadn't been discovered?

A second proposed change in the way level of question is coded is to divide self-reference questions into those having to do with discipline or obedience and those having to do with other matters. Self-reference questions having to do with discipline or obedience would then be treated as a separate category. Such questions include those in which the teacher is (in effect) criticizing or warning a child regarding his academic performance or classroom behavior. Examples include the following:

Did you do your homework last night? (after failure to answer an academic question)

Did you prepare for this assignment?

John, how do we act when we get in line?

John, do you have to make so much noise when you do that?

Did you remember to try to write neatly between the lines?

How are we supposed to hold our books in reading group?

In addition to these two modifications of the system (opinion questions and discipline or obedience self-reference questions), coding distinctions used by others could be combined with aspects of the dyadic system for some purposes. The coding of level of question is independent from the coding of the child's answer or of the teacher's feedback response, as well as from the other types of interactions coded in the system. Consequently any coding distinctions the investigator would wish to introduce could be used in coding level of question, and at the same time the other aspects of the dyadic system could be used as is.

Many of the systems listed in the anthology Mirrors for Behavior (Simon and Boyer, 1970) are systems addressed to level of question, and alternative ways to code questions may be found there (broad-narrow, convergent-divergent, etc.).

The Child's Answer

The children's answers have been coded into one of four categories: correct, part correct, incorrect, or no response. For some purposes these can be simplified into a two category system, correct or incorrect: treating failures to respond as incorrect and coding part correct answers according to whether the teacher stresses the acceptable nature of the part given or the incompleteness or incorrectness of the response. The coding could also be expanded to take into account additional information. It has been suggested, for instance, that the "no response" category be split into two sub-types, depending upon whether the child does anything at all in responding to the question. Thus if the child says "I don't know" or shrugs in response to the teacher, he would be coded as "don't know," while if he remains silent without saying anything or indicating in some way that he cannot respond, he would be coded for "no response." Thus this distinction would separate those instances in which the child remained passive and silent when stuck from those instances in which he actively informed the teacher that he could not answer the question. This distinction is very useful for many research purposes. If the investigator is interested in examining the influence of child behavior upon teacher behavior, it would be instructive to see how teachers respond to children when they remain silent, give the wrong answer, or say "I don't know." For example, student teachers or inexperienced teachers who are threatened by silence might give up most quickly on students when they make no verbal response. Teachers in these situations do not have a response to shape and may be quick to fill the void by giving the child the answer or by calling on someone else.

A coding distinction may also be desirable to handle abortive response opportunities. These occur whenever a child is unable to answer the teacher's question because something happens to interrupt. If he loses his chance because some other child calls out the answer,

the system as presented in the manual has a place to code it. Sometimes, however, a response opportunity is aborted because some commotion interrupts the interaction, because the teacher gets side-tracked in dealing with a disciplinary problem or some other event, because the bell rings, etc. In these cases the investigator may want to record the fact that a child was given a response opportunity, even though the interaction did not proceed to a conclusion and it is not possible to code the child's answer or the teacher's feedback. In such a case the investigators could use an "abort" column as one of the alternatives for coding the child's answer. This would indicate that the child never got a chance to make a response. If this column was used it could also eliminate the necessity for a "call out" column in coding feedback, although the call out measure can be a good index of the degree to which the class is controling the teacher's behavior.

An alternative for handling aborted response opportunities might be simply to cross them out if they are not carried through to conclusion. For most purposes this is probably the simplest way to code, since aborted response opportunities are not very frequent. This method has been used in our own research.

Teacher's Feedback Response

Several new distinctions have been suggested for coding the teacher's feedback following correct responses from the children. Presently the categories of terminal feedback which would apply following a correct answer are: praise, affirmation, no feedback, and process feedback. This list could be expanded and adapted to yield the following:

No feedback: The teacher makes no feedback response whatsoever following the child's answer. She does not indicate that it is correct.

Ambiguous: The teacher reflects the child's answer in a quizzical tone ("You think it's blue?") or in some other way acknowledges his answer but fails to indicate whether or not it is acceptable.

Affirmation: The teacher says "yes," "that's right," "okay" or some other verbal affirmation, or she nods her head affirmatively.

Echo: The teacher repeats the child's response just as he said it (Teacher: "What color is this?" Child: "Blue." Teacher: "Blue.").

Praise: The teacher praises the child verbally or communicates it through gesture or expression when providing affirmation or an echo response.

Expands: The teacher expands the child's answer into a sentence. She doesn't add any new information; she merely adds the linguistic component necessary to make the child's answer into a complete statement (Teacher: "What color is this?" Child: "Blue." Teacher: "Yes, this color is blue."). This distinction (from echo or simple affirmation) might be useful in research in early education or bilingual instruction where language modeling is stressed.

Develops: The teacher accepts the child's response and then adds new information to it by relating it to other aspects in the context of the discussion or by carrying forward a line of reasoning. She doesn't merely expand the child's answer to make a complete statement; she relates his answer to the context, adds other information, or uses the answer to help develop a larger point ("Yes, it is blue. And this one here is blue too.").

Process Feedback: The teacher verbalizes the chain of logic or the cognitive processes through which one goes in order to arrive at the answer (which the child has just given). She may do this as a review for the child who just gave her the correct answer, or she may go through the steps for the benefit of other children who may have not been able to get the right answer. Although this category is conceptually distinct it has much in common with the preceding category (develops) and could be combined with it in cases where the distinction didn't seem worth keeping.

The above categories all apply to the teacher's feedback reaction following a correct response by the child. Certain of these categories could also apply following an incorrect response or a failure to respond. When the child has made an error or has made no response the teacher's feedback can be coded in the following categories:

No feedback: The teacher makes no feedback response whatsoever following the child's answer. She does not indicate that it had been incorrect.

Ambiguous: The teacher reflects the child's answer in a quizzical tone ("You think it is blue?") or in some other way acknowledges his answer, but she fails to indicate that it is not correct.

Negation: The teacher says "No," "That's not right," or some other verbal negation, or she nods her head negatively.

Praise: The teacher will occasionally praise after a wrong response by indicating that the answer was wrong but that the child had made a good attempt to answer the question.

Criticism: The teacher criticizes the child verbally or communicates it through gesture or expression in reacting to a wrong answer or a failure to respond.

Give the Answer: The teacher gives the answer to the child.

Ask other: The teacher asks the class as a group or some other individual child to supply the answer.

Process Feedback: The teacher not only gives the answer but she verbalizes the chain of logic or the cognitive processes through which one goes in order to arrive at the answer (which the child has not been able to give).

Suggestions for altering the categories for sustaining feedback have included both combination suggestions and diversification suggestions. For many purposes it may be unnecessary to retain the separate coding and advisable instead to combine all three of the categories of sustaining feedback, or at least to combine the "repeats" category with the "rephrase or clue" category. Analyses of available data suggest that the categories are meaningfully different, however. When teachers show a pattern of determined working for response with certain children (that is, they have relatively high rates of sustaining feedback compared to terminal feedback when the child is unable to respond), they tend also to have a greater proportion of their feedback coded as "repeat" and a relatively lower proportion as "rephrase or clue." Thus the distinction is worth keeping for investigators interested in communication of expectation and associated phenonema.

Several suggestions have been made for diversifying the "new question" category. As it presently stands, the category includes: new questions which are related to the original question but are simpler; questions which are related to the original question but which involve a development to a different or higher level; questions which are largely unrelated to the original question; and self-reference questions (the latter are often veiled criticisms: "Did you study this material?"). Any or all of these distinctions could be included. It is recommended that critical self-

reference questions be coded separately and not considered as sustaining feedback, since inclusion of such questions as sustaining feedbacks suggests that the teacher is giving the child additional response opportunity when in fact this would not be the case. These critical self-reference questions should be coded as a separate category or else included as behavioral criticism or warning if the investigator does not wish to use the separate category.

A change in the way criticism is coded in certain situations has also been suggested. These situations occur when the teacher accepts and gives feedback to the content of a child's response but criticizes his behavior during or immediately prior to the response. This happens most frequently when a child calls out an answer and the teacher acknowledges his response but criticizes him for calling out an answer without first raising his hand and being recognized. It also occurs in many "discipline question" situations, as when the teacher in responding to a child tells him that maybe he would have known the right answer if he had been paying better attention. Occasionally also the teacher will accept a child's response as correct but will criticize his tone of voice or his tendency to answer too softly or too loudly. In these and certain other situations, the teacher's criticism is directed at the child's classroom behavior (obedience, compliance) and is not criticism for failure to meet the teacher's performance expectations. According to the manual these teacher remarks would nevertheless be coded in the section for coding the teacher's feedback response, thereby implying that the teacher criticized the child for failure to answer the question rather than for misbehavior. For most purposes it is probably more consistent and more valid to code such criticism as behavioral criticism rather than coding it in the feedback to response section, even though it occurred during feedback to response by the child. The teacher's feedback to the content of the child's answer would still be coded in the "Teacher's Feedback Response" columns, but her criticism would be coded in the "Behavioral Criticism" column.

In some instances this change will also affect the way the content of the child's answer is coded. Under certain circumstances the manaul instructs the coder to code situations in which the child gives correct content with inappropriate accompanying behavior as part correct. Again, it seems more consistent and valid to code such situations as follows: The child's answer will be considered correct and the teacher's feedback response will be coded as feedback following a correct answer; the critical aspect of the teacher's reaction will be coded under behavioral warning or criticism.

Special Categories for Use at the Secondary Level

Coding distinctions in addition to those discussed above have been added to the system for the dissertation research of Vernon F. Jones. This research is being done in the secondary schools and attends to the affective aspects of teacher-child interaction as well as the aspects concerning communication of information. These categories take into account that secondary school students are much more active in the classroom than the children in the early grades and also the fact that the teacher-child interactions are more extended than the brief, largely teacher-initiated interactions of the first grade. Many of the coding distinctions would also be useful in studying intermediate level classrooms.

1. Student initiated response opportunities. This category would be used to cover a public response opportunity that is initiated by the student rather than the teacher. Included are situations in which the student raises his hand and asks the teacher a question regarding the matter under discussion or when he contributes some point of information on his own initiative. These are similar to other response opportunities in that they are dyadic teacher-child interactions which are public and monitored by the rest of the class. However they are not introduced by the teacher and do not involve the child answering a question posed by the teacher. Thus in this case no coding would be made in the "answer" column, although the teacher's feedback response to the student-initiated interaction could be coded in the usual manner. These codings would of course be tabulated separately later in order to keep them separated from the normal type of response opportunity when the student answers the teacher posed question. The extent to which students initiate content

related questions may be a useful measure for many research purposes.

In addition to being student initiated, these response opportunities can also be categorized with the usual distinctions. That is, they can be also scored as being either process, product, opinion, choice, or self-reference, according to their content. It may also be useful to separate student-initiated response opportunities which are invited or at least sanctioned by the teacher (welcome contributions) from those which are not (unwelcome interruptions).

2. Joking. Interactions in which the teacher teases, jokes with, or otherwise initiates a light or humorous interaction with a student are coded in this category. These may occur either in private dyadic conversations or in public conversations in which the teacher's remarks are meant solely for the individual student. Such interactions would be simply tallied, similar to the way created and afforded work, procedure and behavior interactions are tallied.

3. Personal conversation. This category would be used if the teacher engages in conversation with a student which has nothing to do with classroom work or classroom management. Such conversations might include sporting events, school policy or happenings, personal preferences or interests, etc.

Many of the things that would be coded as self-reference response opportunities in the public response opportunity situation would be coded in this category if the same topics were treated in a dyadic private conversation. This category, along with the preceding one, separates personal interactions from the more impersonal ones having to do with classroom routine or procedures. Thus interactions concerning equipment or supplies, helping the teacher by running an errand, or similar sorts of interactions would still be coded as procedural interactions, while the present category would be reserved for personal interactions on topics not immediately related to the classroom. As with the preceding category, each such interaction would be simply tallied.

The preceding two distinctions can be seen as specialized categories of non-academic interactions. Neither tends to occur very frequently in the early grades, where the great majority of non-academic interactions are either behavioral or procedural in the usual sense. These categories could also be used as sub-categories for categorizing the student initiated

interactions with the teacher. That is, if a student initiates a joking interaction with a teacher or initiates a non-academic conversation with her, such data could be recorded by using the previous distinctions as sub-categories under student initiated interactions.

Basic Measures

Although hundreds of measures could be generated from the various categories used in a dyadic system, the number and type of different scores used by a given investigator will depend on the problem under study. There are two basically different types of measures that can be derived from the system: simple frequency counts (quantitative measures), and percentage scores derived by combining the data according to predesigned formulas (qualitative measures). Depending on the kinds of distinctions built into the coding of the given study and also upon the design of the coding sheets used, the data on the coding sheets may have to be processed through one or more intermediate levels before reaching its final form.

The simplest situation for data analysis occurs when there is no missing data problem. In fact, if investigators can plan before beginning the study to avoid the problem of missing data, they can simplify analyses considerably. In the research reported in R&D Report Number 25, for example, the missing data problem was eliminated by identifying substitute children to watch during observation periods when the primary target children were absent. In this way it was possible to observe the teacher interacting with three children of each type (high expectation boys, low expectation boys, high expectation girls, and low expectation girls) even if a child normally observed happened to be absent. Thus frequencies could be simply summed and used as scores--there was no need to convert to mean scores by dividing the sums in each column by the number of observations. Whenever there is a problem of missing data, either because classes were observed for unequal amounts of time or because children missed some of the observation periods due to absences, the investigators should express the frequency data in means rather than in sums. Thus the score for behavioral criticisms toward a given child, for example, would be the sum total of behavioral criticisms divided by the number of observation periods in which he was present, thus yielding a mean score reflecting number of criticisms per observation. If

observation periods were of unequal lengths the sums should be divided by the number of hours observed, thereby yielding a mean figure expressed in terms of number of criticisms per hour of observation.

Intermediate stages of data preparation will be required if the data have been recorded in hierarchical fashion. In the coding sheet shown in the manual (report number 27), for example, there is one set of columns for coding the nature of the teacher's feedback response. The same columns are used to code the teacher's feedback regardless of whether the child's answer was correct, part correct, incorrect, or no response. This means that the teacher feedback data cannot simply be added up by summing all the checks or numbers that appear in a given column. Instead, the data have to be separately tabulated in order to separate teacher feedback following correct responses from teacher feedback following incorrect responses, teacher feedback following part correct responses, and teacher feedback following situations in which the child did not respond. Further sub-division of the data would be required if, for example, the investigator wanted to look separately at teacher feedback following correct answers to the product questions as opposed to teacher feedback following correct answers to choice questions. Thus as a general principle that should be borne in mind, <u>any distinctions the investigators wish to make in the data must be reflected in the scores used</u>. The data must be expressed, originally at least, in the smallest of the sub-categories in which the investigator is interested. Sub-categories can of course always be combined later in order to get data for larger categories, but there is no way to sub-divide the data into the smaller categories unless these distinctions are built into the analysis in the first place.

There are two basic ways of building the distinctions into the analysis. The first is to build them right into the design of the coding sheet. This is done for many of the distinctions used in the system, so that each distinction in which we are investigators were interested was built into the coding sheet as a separate column. Given this design, it is possible to get the data of interest simply by summing the entries in a given column (and dividing by the number of observations in cases where mean figures were desired). This format was not followed with respect to the coding of teacher feedback following different types of child answers, although it could have been if we had used a much wider coding sheet and provided a separate set of teacher feedback columns

for each type of child answer. This was rejected in favor of the system used because it was thought that the great increase in number of columns on the coding sheet might cause more problems in coding than the savings in data processing time would justify. Consequently the system as shown in Report #27 was used, with the resulting cost in increase data processing time. The extra step of compiling separate totals of teacher responses following correct answers, part correct answers, etc. was thus required.

As a general rule it is recommended that the investigators build as much as possible right into the design of the coding sheet in order to save steps in data processing later. This should not be done to the point of decreasing gains, however, and it clearly should be avoided if it appears to threaten coding validity. When it results in a coding sheet so large and complex that coders lose time trying to find their place, other solutions should be sought.

Frequency Measures

Many frequency measures are useful for comparing teachers, and some are also useful for comparing children (although for the latter comparisons the derived percentage measures are usually the more appropriate). Frequency measures are expressed in sums when observation times do not differ or in means when they do. Some of the more useful frequency measures are the following:

1. Direct questions.
2. Open questions.
3. Call outs.
4. Student initiated response opportunities.
5. Total response opportunities (summing the above).
6. Self-reference response opportunities.
7. Teacher afforded work related contacts.
8. Teacher afforded procedural contacts.
9. Teacher initiated conversational contacts.
10. Teacher initiated joking contacts.
11. Total teacher initiated contacts (sum of the preceding four).
12. Child initiated work related contacts.
13. Child initiated procedural contacts.
14. Child initiated joking contacts.
15. Child initiated conversational contacts.

16. Child initiated contacts total (sum of the preceding four).
17. Discipline questions.
18. Behavioral praise.
19. Behavioral warning.
20. Behavioral criticism.
21. Total behavioral contacts (sum of the preceding four).
22. Total dyadic work contacts (teacher initiated plus child initiated).
23. Total dyadic procedure contacts (teacher initiated plus child initiated).
24. Total joking contacts (teacher initiated plus child initiated).
25. Total conversational contacts (teacher initiated plus child initiated).
26. Total dyadic contacts (response opportunities plus created contacts plus afforded contacts plus behavioral contacts).

Derived Percentage Measures

Percentage measures derived from the means are used to get qualitative data on teacher-child interaction patterns to supplement the quantitative scores listed above. The basic logic involved is to identify sets of coding categories that apply in given situations, such as teacher feedback responses following correct answers or teacher behavior during afforded work contacts. There are several codes for teacher behavior in these instances. Teacher-child interaction patterns involving different children will differ from one another in two ways. The first is quantitative: a given child will have more correct answers in the same observation time than another child. The second difference is qualitative: regardless of the differences in the number of right answers, there may also be differences in the percentage of teacher reactions of different types when the child has given the right answer. Differences in the latter types of patterns can be measured by using ratio scores which express the teacher's frequency of giving a particular response to a right answer as a percentage of the teacher's total responses to right answers. Useful percentage scores which have been identified to date include the following:

A. Measures of Teacher vs. Child Initiation of Dyadic Interactions:
   1. Direct questions over direct questions plus open questions.
   2. Direct questions over response opportunities
   3. Open questions over response opportunities.
   4. Call outs over response opportunities.

5. Student initiated response opportunities over total response opportunities.
6. Created work contacts over total created contacts.
7. Afforded work contacts over total afforded contacts.
8. Created work contacts over total work contacts.
9. Created procedure contacts over total procedure contacts.

B. Level of Question Measures

1. Process questions over total questions.
2. Choice questions over total questions.
3. Opinion questions over total questions.
4. Product questions over total questions.

C. Types of Dyadic Interaction

1. Self reference questions over total response opportunities
2. Behavioral contacts (behavior praise,warning and criticism plus discipline questions) over work contacts (academic response opportunities plus work related dyadic contacts).
3. Procedural contacts (afforded plus created) over total work contacts.
4. Conversational contacts (afforded plus created) over total work contacts.
5. Joking contacts (afforded plus created) over total work contacts.

D. Child Performance Measures

1. Correct answers over total answers.
2. Wrong answers over wrong answers plus no response. (This measure gives an idea of the degree to which the child will take a guess when he is not sure of the correct response).
3. "I don't know" answers over "I don't know" answers plus silence.
4. Errors over number of reading turns.

E. Praise and Criticism of Academic Performance

1. Praise following correct answers over total correct answers.
2. Affirmation (including praise) of right answers over total right answers.
3. Negation (including criticism) following wrong answers over total wrong answers.
4. Criticism after wrong answers over total wrong answers.
5. Criticism after no response over total no response.

6. Criticism after "I don't know" responses over total "I don't know" responses.
7. Praise in created work contacts over total created work contacts.
8. Criticism in created work contacts over total created work contacts.
9. Praise in afforded work contacts over total afforded work contacts.
10. Criticism in afforded work contacts over total afforded work contacts.
11. Total praise of academic work (adding praise occuring in response opportunities to praise occuring in work related dyadic contacts)
12. Total criticism of academic work (adding criticism and response opportunities plus criticism in work related dyadic contacts).

F. Praise and Criticism of Behavior

1. Warning over warning plus criticism (this measure gives the degree to which the teacher merely warns the child about his behavior versus attacking it with more personal and intense criticism).
2. Total behavioral praise (adding behavioral praise plus praise occurring in procedural contacts).
3. Total behavioral criticism (adding behavioral criticism and warnings, discipline questions, and criticism in procedural contacts).

G. Quality of Feedback

1. Percent of responses in which the teacher gives no feedback at all (instances of no feedback over total responses).
2. Process feedback over response opportunities.
3. Process feedback over product feedback.
4. Echo over echo plus affirmation.
5. Expansion feedback rate over total feedback.
6. Development feedback rate over total feedback.
7. Process feedback plus development feedback over total feedback.
8. Process feedback in created work contacts over total created work contacts.
9. Process feedback and afforded work contacts over total afforded work contacts.
10. Total process feedback (adding process feedback occurring in response opportunities plus process feedback occurring in dyadic work related contacts).

H. Sustaining the Interaction after the Initial Response Opportunity

1. New questions following right answers over total right answers.
2. Repeat over repeat plus rephrase and clue plus new questions in feedback following failure (this measure gives the teacher's tendency to demand response to the original question rather than help the child).
3. Failure followed with sustaining feedback by teacher over total failures. (This measure gives the degree to which the teacher sticks with the child is a failure situation rather than give him the answer or call on someone else).

In addition to the measures listed above new ones could also be used in studies that had enough data. These would be made by combining the ones listed above in different ways than those mentioned or by sub-dividing still further (for example praise following correct answers to process questions could be separated from praise following correct answers to product questions, to opinion questions, and to choice questions). Certain other measures used presently were also left off the list to avoid repetition; these include children's answers and teacher feedback responses to questions asked during reading groups and also teachers' feedback responses following reading errors during reading groups. In each instance the scores used for teachers' feedback responses would be similar listed above, the only difference being that they would apply only to this subset of child responses and would be kept separate from those occurring in the general class interactions.

It is recommended that the procedures used above be followed in deriving percentage scores from the data. The percentage scores are derived by using a subset as the numerator and including in the demoninator the numerator itself plus other members of the set which is under consideration. This is used in preference to a ratio in which the numerator would not also appear in the demoninator (warning over criticism, for instance, instead of warning over warning plus criticism). The simpler ratio measures have the disadvantage of fluctuating wildly when the denominators are small, whereas the percentage measures which also include the numerator in the denominator result in scores that fluctuate only between zero and 1.0. This makes for more stable scores and minimizes the likelihood of obtaining spurious findings due to extreme skewness introduced into the distribution by subjects with very low frequencies in the denominators of the measures.

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